

battery pack, respectively. The high voltage charging unit is connected with the battery pack; during quick charging, the main battery and each second battery are switched to a series connection state, a charging voltage is transmitted to the high voltage charging unit and the low voltage charging unit via the charging port, and the high voltage charging unit charges the main battery and each second battery. Meanwhile, the low voltage charging unit supplies power to the system; when charging is completed, the main battery and each second battery are switched to a parallel connection state to supply power to the system.

[0012] According to the other aspect of the present disclosure, the present disclosure also discloses a mobile terminal, which includes a battery voltage-multiplying charging circuit, wherein the battery voltage-multiplying charging circuit includes a charging port, a high voltage charging unit, a low voltage charging unit, a battery pack, and a system, wherein the battery pack includes a main battery and at least one second battery. The high voltage charging unit and the low voltage charging unit are connected with the charging port, respectively, and the low voltage charging unit is connected with the system and the battery pack, respectively. The high voltage charging unit is connected with the battery pack; during quick charging, the main battery and each second battery are switched to a series connection state, a charging voltage is transmitted to the high voltage charging unit and the low voltage charging unit via the charging port, and the high voltage charging unit charges the main battery and each second battery. Meanwhile, the low voltage charging unit supplies power to the system. When charging is completed, the main battery and each second battery are switched to a parallel connection state to supply power to the system.

[0013] The battery voltage-multiplying charging circuit provided by the embodiments of the present disclosure includes a high voltage charging unit, a low voltage charging unit, and a battery pack including a main battery and at least one second battery. During quick charging, the main battery and each second battery are switched to a series connection state, and the high voltage charging unit provides a multiplied voltage, namely a voltage higher than an existing common charging voltage by several times, for charging. Charging solutions that use multiplied voltage are capable of increasing the charging speed of the battery pack. Additionally, as the batteries in the battery pack are connected in series, the value of the current flowing through each battery still cannot be increased in spite of the improvement of the charging voltage. Therefore, it may not result in the issue of battery heating due to overhigh current flowing through the batteries. It thus can be seen that the battery voltage-multiplying charging circuit provided by the embodiments of the present disclosure is capable of effectively solving the issue of battery heating due to the increase of the current flowing through the battery bodies while providing quick charging for the batteries. Besides, when the battery voltage-multiplying charging circuit provided by the embodiments of the present disclosure charges the battery, it is configured that the low voltage charging unit rather than the battery pack to be charged supplies power to the system. When compared with the existing battery charging solutions where batteries need to supply power for systems while being charged, the battery charging speed can be increased as well.

[0014] The above descriptions are merely summary of the technical solutions of the present disclosure. In order to

understand the technical means of the present disclosure more clearly, they can be implemented according to the contents of the description. In addition, in order to make the above and other objectives, features and advantages of the present disclosure more obvious and understandable, specific embodiments of the present disclosure are described below.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] In order to describe the embodiments of the present disclosure or technical solutions in the prior art more clearly, accompanying drawings needing to be used in the descriptions of the embodiments or the prior art will be introduced briefly. It would be obvious that the accompanying drawings in the descriptions below are some embodiments of the present disclosure, and for a person ordinarily skilled in the art, other drawings may also be obtained according to the accompanying drawings without creative labor.

[0016] FIG. 1 is a charging architecture diagram of an existing quick charging solution of a first class.

[0017] FIG. 2 is a charging architecture diagram of an existing quick charging solution of a second class.

[0018] FIG. 3 is a schematic diagram of a battery voltage-multiplying charging circuit according to a first embodiment of the present disclosure.

[0019] FIG. 4 is a schematic diagram of a battery voltage-multiplying charging circuit according to a second embodiment of the present disclosure.

DESCRIPTION OF THE EMBODIMENTS

[0020] In order to make the objectives, technical solutions and advantages of the embodiments of the present disclosure more clear, the technical solutions in the embodiments of the present disclosure will be described below clearly and completely in conjunction with the accompanying drawings in the embodiments of the present disclosure. Obviously, the described embodiments are part of embodiments of the present disclosure, not all embodiments. On the basis of the embodiments in the present disclosure, all the other embodiments obtained by people ordinarily skilled in the art without creative labor fall into the scope of protection of the present disclosure.

A First Embodiment

[0021] By referring to FIG. 3, illustrated is a schematic diagram of a battery voltage-multiplying charging circuit according to a first embodiment of the present disclosure.

[0022] The battery voltage-multiplying charging circuit of this embodiment of the present disclosure includes a charging port 301, a high voltage charging unit 302, a low voltage charging unit 303, a battery pack 304, and a system 305, wherein the battery pack 304 includes a main battery 3041 and at least one second battery 3042.

[0023] Wherein, the high voltage charging unit 302 and the low voltage charging unit 303 are connected with the charging port 301, respectively, and the low voltage charging unit 303 is connected with the system 305 and the battery pack 304, respectively; the high voltage charging unit 302 is connected with the battery pack 304.

[0024] During quick charging, the main battery 3041 and each second battery are switched to a series connection state, a charging voltage is transmitted to the high voltage charging unit 302 and the low voltage charging unit 303 via the